National Institute of Environmental Health Sciences

Weather-driven variation in dengue activity in Australia examined using a process-based modeling approach

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Abstract:

The impact of weather variation on dengue transmission in Cairns, Australia, was determined by applying a process-based dengue simulation model (DENSiM) that incorporated local meteorologic, entomologic, and demographic data. Analysis showed that inter-annual weather variation is one of the significant determinants of dengue outbreak receptivity. Cross-correlation analyses showed that DENSiM simulated epidemics of similar relative magnitude and timing to those historically recorded in reported dengue cases in Cairns during 1991-2009, (r Euro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 0.372, P < 0.01). The DENSiM model can now be used to study the potential impacts of future climate change on dengue transmission. Understanding the impact of climate variation on the geographic range, seasonality, and magnitude of dengue transmission will enhance development of adaptation strategies to minimize future disease burden in Australia.

Source: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3541748

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Meteorological Factors, Precipitation, Temperature

Temperature: Fluctuations

Geographic Feature:

resource focuses on specific type of geography

Ocean/Coastal, Other Geographical Feature

Other Geographical Feature : rainforest

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Australasia

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Vectorborne Disease

Vectorborne Disease: Mosquito-borne Disease

Mosquito-borne Disease: Dengue

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology: ☑

type of model used or methodology development is a focus of resource

Outcome Change Prediction

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Short-Term (

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content